Honeywell

# XL 1000 Series

## FOR SMOKE CONTROL

## HONEYWELL EXCEL 5000 OPEN SYSTEM

**INSTALLATION AND COMMISSIONING INSTRUCTIONS**

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**Trademark Information**

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**⚠ WARNING**

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. Any unauthorized modification of this equipment may result in the revocation of the owner's authority to continue its operation.

# General

The XL1000 Series is designed to provide heating, ventilating and air-conditioning control. They can operate either standalone, or networked to Honeywell central workstations such as EBI. These controllers can also be used for smoke control system monitoring and control, for monitor and control of fire (UL864), and general purpose signaling (UL2017). In UL2017 applications, the product can be used as a type NM (Non-Monitored) system. It is also approved for UL916 (Energy Management Equipment.)

The XL1000 Series can be used for smoke control applications when used in conjunction with a UL-listed fire alarm control panel (FACP) and UL-listed fire fighters' smoke control station (FSCS).

# Before Installation

1. Unpack door and remove the XL1000 from carton. Check equipment and report any damage to a Honeywell representative.
2. Verify cabinet is installed correctly.
3. Securely mount the XL1000 to a rigid structural surface using at least four sets of 1/4 in. (6 mm) mounting hardware (supplied locally).

**NOTE:** Anchoring materials must be suitable for the mounting surface (wood, concrete, steel). Mounting must comply with all local codes.

4. Obtain correct number and type of sheet metal screws for subpanel. Installation of a full-size subpanel requires six no. 10 x ½-inch (13 mm) sheet metal screws (not supplied). Installation of a smaller subpanel requires four no. 10 x ½-inch (13 mm) sheet metal screws (not supplied).
5. Obtain 14505159-001 Tamper Switch per job requirements. Installation of Tamper Switch is optional.

# Installation

Mount controller subpanel in cabinet so all labeling is visible. Secure full-size subpanel in place with six no. 10 x ½-inch (13 mm) sheet metal screws (not supplied). Secure smaller subpanel with four no. 10 x ½-inch (13 mm) sheet metal screws (not supplied).

**NOTE:** Subpanel must mount flat and should not bulge or recess anywhere.

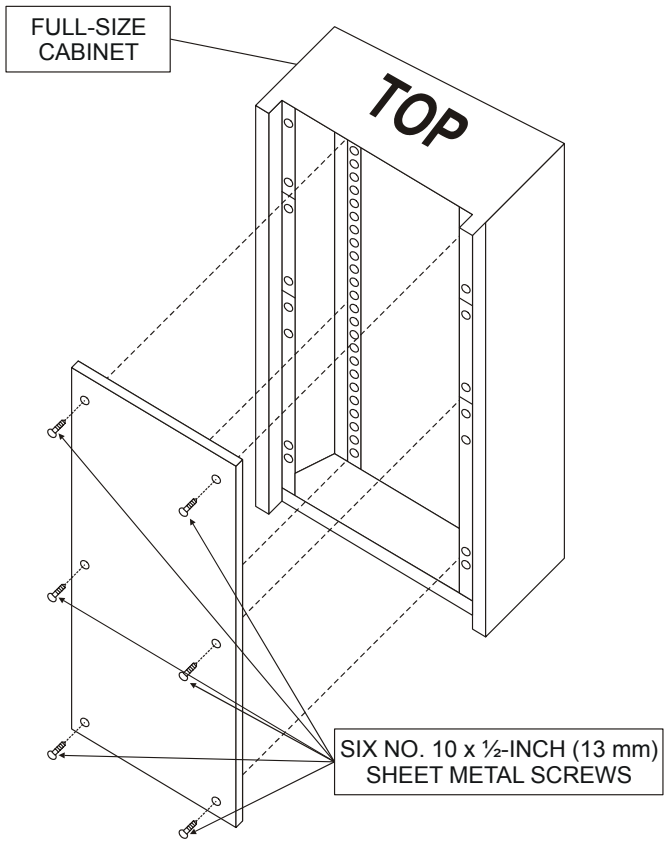



**Fig. 1. Mounting controller subpanel in cabinet (full-size subpanel cabinet shown)**

# Wiring

All wiring to the XL1000 controller is unsupervised, except as noted.

All circuits are power limited, except for AC power circuits, relay contacts and other circuits as noted.

All field wiring terminals accept 24 AWG to 14 AWG (0.25 $mm^2$ to 2 $mm^2$) conductors except as noted.

All wiring must conform to local codes, ordinances, and regulations. Refer to job drawings for details.

Verify that the voltage difference between any conductor and earth ground does NOT exceed 150 Vac.

1. Connect input/output device wiring, LONWORKS Bus transmission wiring, and 14507063 Power Cable to Controller per job drawings. Fig. 2 and Fig. 3 show typical controller wiring. Four Power Module models are available (see Table 2).
2. Connect line voltage to Terminals H and N of the 14507287 Power Module. Connect a good earth ground to Terminal G of the Power Module. Fig. 13 through Fig. 15 show typical power wiring.
3. For Power Modules -001 through -007, leave power to Power Supply and Controller OFF. Connect 14507063 Power Cable from Controller to Power Module.

## ⚠ WARNING

**Risk of electric shock or equipment damage!**

► Subpanel and Controller power must remain OFF until Controller is checked.

4. Install optional Tamper Switch on cabinet per instructions in the cabinet installation instructions. Wire Tamper Switch per job drawings.
5. Mount cabinet door.

## CAUTION

**Risk of electric equipment damage! Excessive static can burn out equipment.**

► Observe proper anti-static material handling practices when installing or servicing PC parts and related components.
► Observe proper equipment and body grounding practices.
► Discharge static electricity from your body before handling parts.

**Table 1. Connector terminal specifications**

| connector terminal | pin | signal type | input / output | voltage type | max. voltage | max. current | max. frequency | max. line impedance |
|---|---|---|---|---|---|---|---|---|
| analog input | | AI | input | SIGNAL | ±12 V | ±20 mA | 9600 baud | 8K ohms |
| digital input | | DI | input | SIGNAL | ±10 V | ±20 mA | -- | 15K ohms |
| analog output | | AO | output(1 | SIGNAL | ±10 V | ±20 mA | 9600 baud | 8K ohms |
| digital output | | DO | output(2 | AC/DC | ±24 VAC/DC | ±50 mA | -- | 10K ohms |
| totalizer output | | TI | input | SIGNAL | ±12 V | ±12 mA | 100 Hz | |
| signal ground | | GND | -- | -- | -- | -- | -- | -- |
| (1 special application; (2 regulated | | | | | | | | |

**Table 2. Power module models**

| model | transformer max. input | | | (48 VA) controller VAC output | accessory output | convenience outlet |
|---|---|---|---|---|---|---|
| | Vac | current draw | Hz | | | |
| 14507287-001 | 120 | 0.5 A | 60 | 24 | | 120 Vac, 10A |
| 14507287-002 | 120 | 1.7 A | 60 | 24 | 24 Vac, 100 VA, 24 Vac, 40 VA | 120 Vac, 10A |
| 14507287-003 | 120 | 1.7 A | 60 | 24 | 24 Vac, 100 VA, 24 Vdc, 600 mA | 120 Vac, 10A |
| 14507287-007 | 120 | 120 A | 60 | 24 | -- | -- |

## XL1000 Series Power Consumption

When selecting the appropriate power supply, the power consumption of the I/O modules must be taken into account.

**Table 3. XL1000 power consumption**

| | max. power consumption | |
|---|---|---|
| **model** | **24 Vac, 60 Hz** | **24 Vdc** |
| XL1000 with watchdog load | 500 mA | 500 mA |
| XL1000 without watchdog load | 500 mA | 500 mA |
| XFL821AU | 130 mA | 80 mA |
| XFL822AU, XFLR822AU | 160 mA | 90 mA |
| XFL823AU | 180 mA | 130 mA |
| XFL824AU, XFLR824AU | 140 mA | 90 mA |

## I/O Modules

### I/O Modules

The XL1000 operates together with LONWORKS I/O modules (dark-gray housings) with communication via LONWORKS (FTT10-A, link power compatible) for easy integration and use with 3rd-party controllers.

### Terminal Sockets

The I/O modules are mounted on the appropriate terminal sockets.

### Color Coding

To distinguish modules and components, the following color coding is used:

**Table 4. Color coding of I/O Modules**

| color | part |
|---|---|
| **red** | All of the user-accessible adjustable mechanical parts (i.e., bridge connectors and locking mechanism) and operating controls (manual overrides, etc.) |
| **dark-gray** | LONWORKS I/O modules |

### I/O Module Overview

**Table 5. Overview of I/O modules and corresponding terminal sockets**

| LONWORKS I/O module | description | inputs | outputs | manual overrides | status LEDs [1] | socket | scope of delivery |
|---|---|---|---|---|---|---|---|
| XFL821AU | Analog Input Module | 8 | – | – | – | XS821-22 | 1 terminal socket, 1 bridge connector 1 swivel label holder |
| XFL822AU | Analog Output Module | – | 8 | – | 8 | | |
| XFLR822AU | Analog Output Module | – | 8 | 8 | 8 | | |
| XFL823AU | Binary Input Module | 12 | – | – | 12 | XS823 | 1 terminal socket, 1 bridge connector 1 swivel label holder |
| XFL824AU | Relay Output Module | – | 6 [2] | – | 6 | XS824-25 | 1 terminal socket, 1 bridge connector 1 swivel label holder 1 long cross connector |
| XFLR824AU | Relay Output Module | – | 6 [2] | 6 | 6 | | |

[1] In addition to the power LED and service LED
[2] Changeover outputs

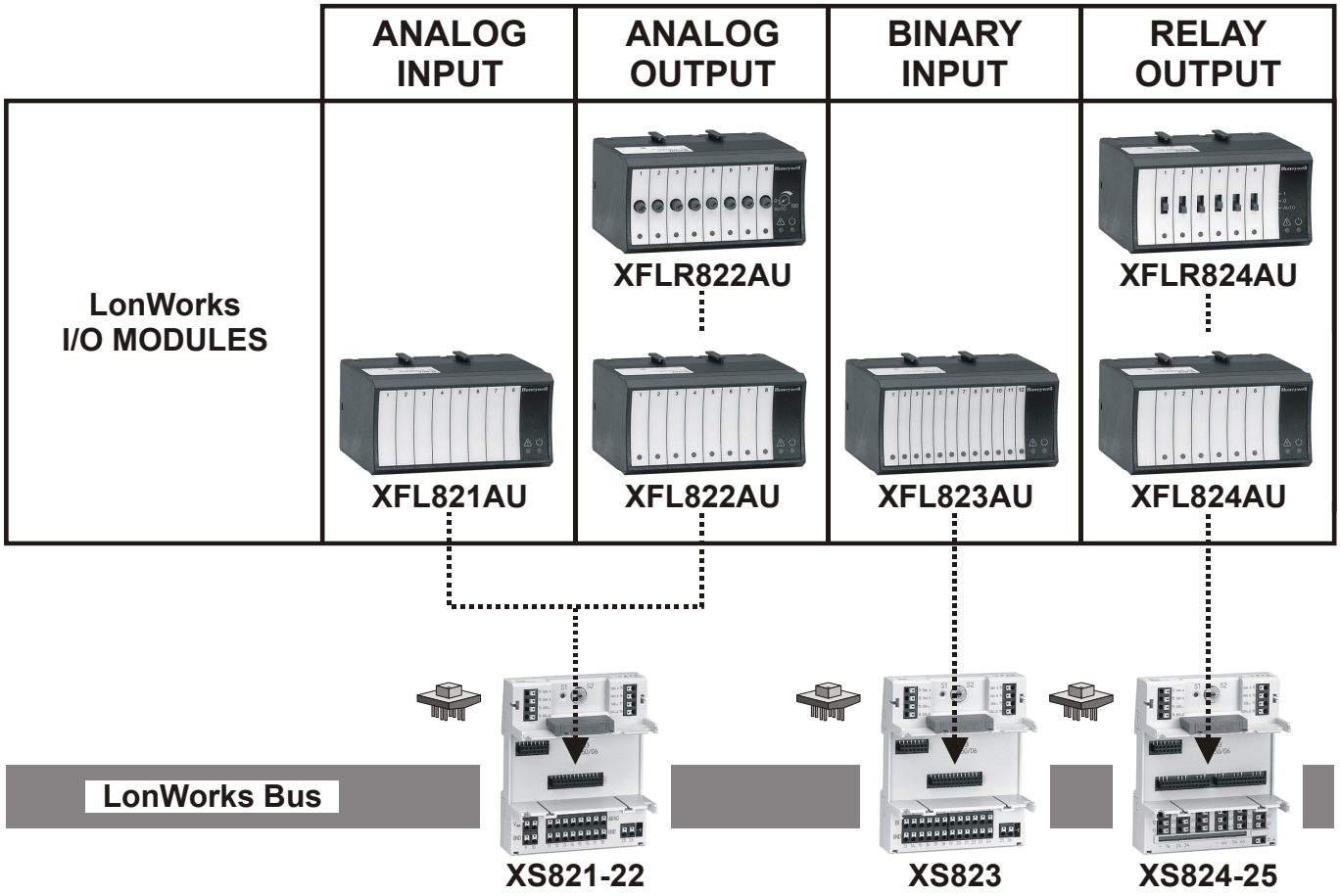



**Fig. 2. Overview of I/O modules and terminal sockets**

# Description of the XL1000 Controller

## Overview

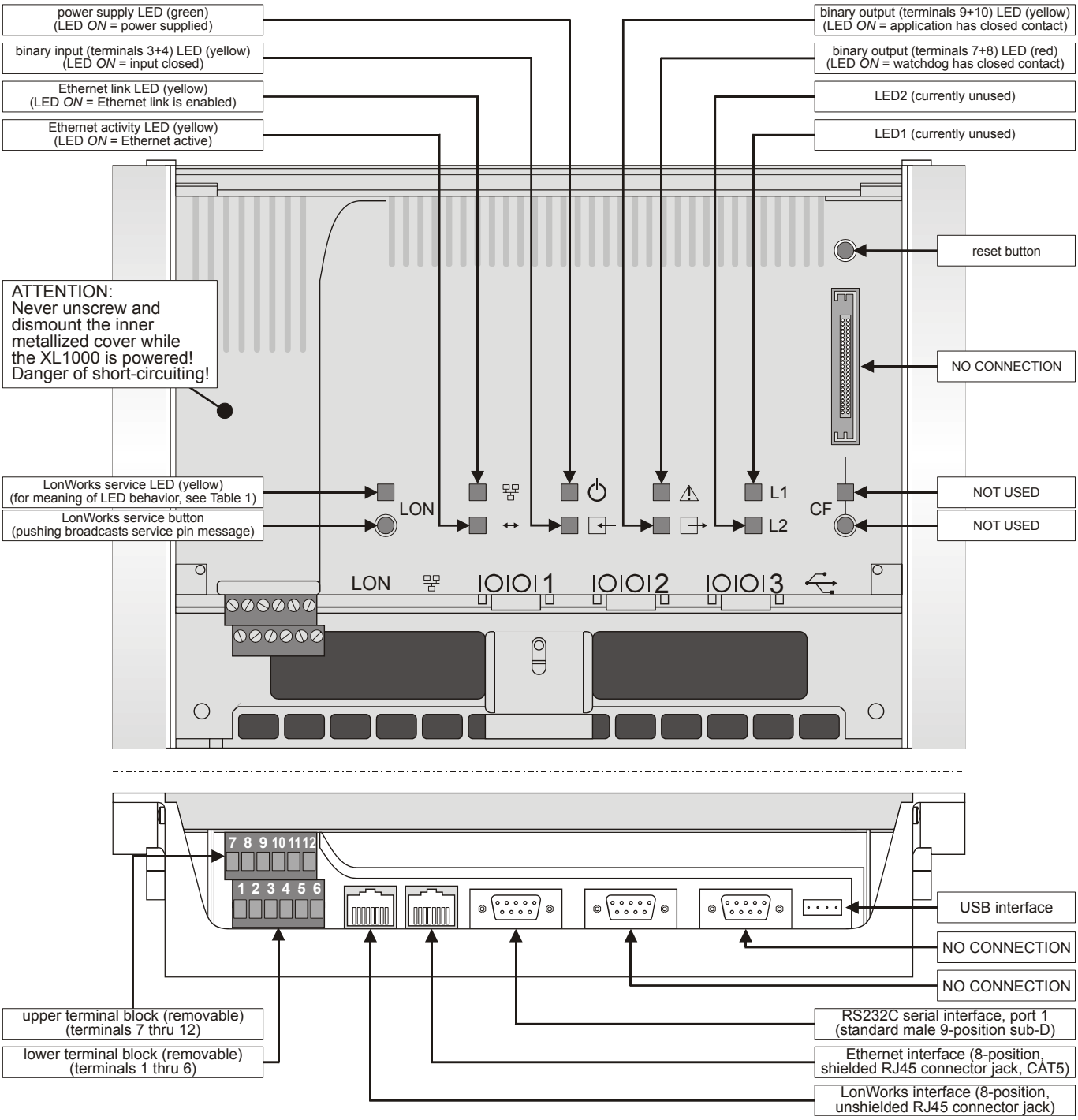



**Fig. 3. Connections to the XL1000 Controller**

## Terminal Blocks

The XL1000 features two rows of removable terminal blocks (located at the front left-hand side; see Fig. 3) for the connection of cables to the two binary outputs and the binary input as well as for connecting LONWORKS and the power supply. A nearby sticker provides an overview of the terminal assignment (see Fig. 4).

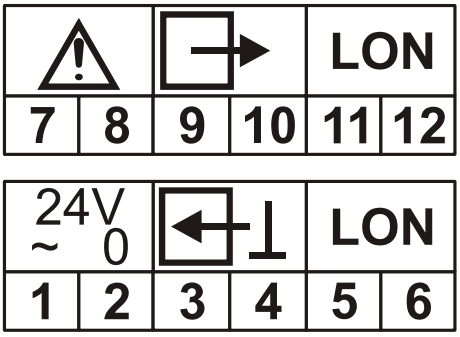



**Fig. 4. Terminal assignment sticker**

Maximum torque for fastening the wiring terminal screws is 0.5 Nm (4.5 lb-in).

Table 6 provides a more-detailed explanation of the terminals and their functions.

**Table 6. Overview of terminals and functions**

| term. | function |
|---|---|
| 1+2 | power supply (24 Vac) |
| 3+4 | a binary input (normally-open, 36 Vdc; pin 4 is the signal ground), freely configurable (using CARE 7) to read input from ***either*** 1) a field device ***or*** 2) a collective alarm input ***or*** 3) a 2nd XL1000 whose duties it could then assume in the event of its failure |
| 5+6 | LONWORKS |
| 7+8 | a binary output / "watchdog relay" (SPDT, normally closed, 24 Vac, max. 2 A permanent load), permanently configured to output to an alarm device (which can then signal that XL1000 is malfunctioning) |
| 9+10 | a binary output (potential-free contact, SPST, normally-open, 24 Vac, max. 2 A permanent load), configurable (using CARE) to output to ***either*** 1) a field device ***or*** 2) a 2nd XL1000 which could then assume the 1st XL1000's duties in the event of its failure |
| 11+12 | LONWORKS |

## LonWorks Interface

The XL1000 is equipped with a LONWORKS interface (specifically: an RJ45 jack) for communication on LONWORKS networks.

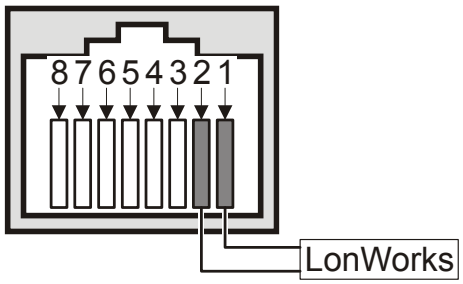



**Fig. 5. LonWorks interface (RJ45 jack)**

There are two methods of connecting the XL1000 to the LONWORKS network (both or either connection method can be used):

- via terminals 5+6 and 11+12 of the terminal blocks (see Fig. 3); and/or
- via the corresponding jack located to the right of the terminal blocks (see Fig. 5).

See also section "LonWorks Service LED and Service Button" on page 9 for details on the corresponding LONWORKS service LED and one LONWORKS service button.

## Ethernet Interface

The XL1000 is equipped with a 10/100-Mbaud Ethernet interface (specifically: an RJ45 jack) permitting communication (as per IEEEC 802.3) on BACnet/IP networks.

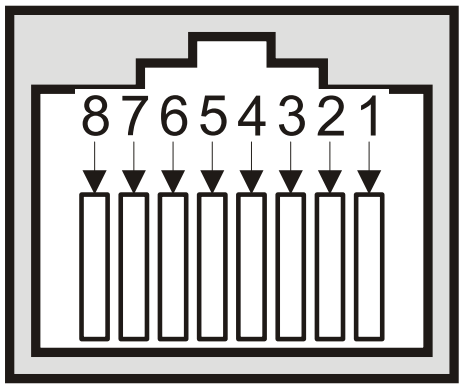



**Fig. 6. Ethernet interface**

When thus connected, the user sitting at a platform hosting EBI can thus e.g. view and edit the time programs, trend values, etc. of the other devices in the BACnet/IP network.

This Ethernet jack conforms to the specifications of the following two Ethernet sub-standards:

- 100Base-TX (twisted pair / star wiring; 100 Mbaud Ethernet based on Manchester signal encoding over category 5 or better twisted pair cable; max. segment length = 100 meters) and

- 10Base-T (twisted pair / star wiring; 10 Mbaud Ethernet based on Manchester signal encoding over category 3 or better twisted pair cable; max. segment length = 100 meters).

## RS232C Serial Interface Ports

The XL1000 is equipped with three male 9-pin sub-D jacks into which corresponding female 9-pin sub-D plugs can be inserted for various different purposes (see following sub-sections). These ports allow data transmission rates of 9.6, 19.2, 76.8, or 115.2 kBaud (the default).

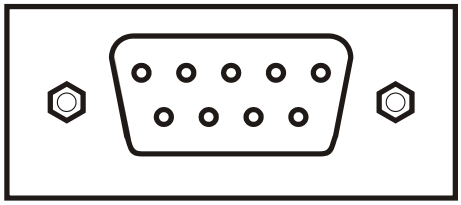


**Fig. 7. RS232C serial interface**

The user can configure the specific desired data transmission rate of each individual RS232C port; it is thus possible for the three ports to operate simultaneously at three different rates.

### Port 1 (Factory Service Interface)

Port 1 is intended for the connection (as needed) of a platform for the purpose of servicing (in the factory, only) the XL1000. In this context, "servicing" comprises a group of different activities including:

- updating portions of the XL1000's Operating System (namely: LINUX, BACstack, Apache Web-Server) and
- diagnostics (Linux, firmware).

### Port 2 (Browser Interface)

NO CONNECTION.

### Port 3 (Modem Interface)

NO CONNECTION.

## CF Port LED, Request Button, and Slot

NO CONNECTION.

## USB Interface Downloads

The XL1000 is equipped with a USB port into which a standard USB type-A connector can be inserted. This USB interface is the recommended interface for downloading applications. The following USB host networking adapter has been approved: BELKIN DIRECT CONNECT (BELKIN order no.: F5U104 or F5U104G at www.belkin.com).

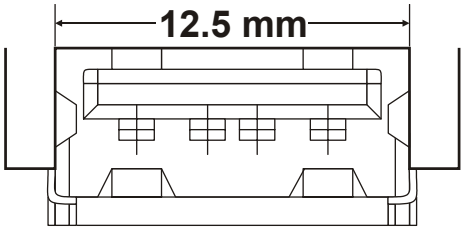



**Fig. 8. USB interface**

Alternatively, either of the following two adapters can also be used: SMC 2208USB/ETH and SMC 2209USB/ETH.

## LEDs and Buttons

### LonWorks Service LED and Service Button

The XL1000 is equipped with a LONWORKS service LED and a LONWORKS service button, together marked "LON" (see Fig. 3). They are used for commissioning the XL1000 and for troubleshooting.

#### LonWorks Service Button

When the LONWORKS service button is pressed, the service pin message is broadcast on the LONWORKS network, and all LONWORKS tools currently connected to the LONWORKS network will receive this message.

#### LonWorks Service LED

The LONWORKS service LED can display various behaviors having different meanings (see Table 7).

## Power Supply LED

The LED marked " ⏻ " indicates whether or not the XL1000 is currently under power. Specifically, when it is lit, the XL1000 is under power; when it is dark, the XL1000 is not under power.

## Binary Input (terminals 3+4) LED

The LED marked " ⊣ " indicates the state of the binary input (which is a normally-open contact) located at terminals 3 and 4. Specifically, when it is lit, the binary input is closed; when it is dark, the binary input is open.

## Binary Output (terminals 7+8) LED

The LED marked "⚠" indicates the state of the binary output ("watchdog" relay) at terminals 7 and 8 (which is a normally closed contact). Specifically, when it is lit, the alarm contact is open; when it is dark, the alarm contact is closed.

## Binary Output (terminals 9+10) LED

The LED marked " ⊡→ " indicates the state of the binary output at terminals 9 and 10 (which is a normally-open contact). Specifically, when it is lit, this means that the application has closed the relay; when it is dark, the relay is open.

**Table 7. LONWORKS service LED behaviors / meanings**

| | LED behavior | meaning |
|---|---|---|
| 1 | LED remains OFF after power-up. | Defective XL1000 hardware (e.g. power supply problems, clock problems, or defective Neuron Chip). |
| 2 | LED is lit continuously after first power-up. | Defective XL1000 hardware. |
| 3 | LED flashes at power-up, goes OFF, and then is lit continuously. | Neuron chip lacks LONWORKS interface program. Remedy: Use Excelon or LonMaker, set XL1000 online. |
| 4 | LED flashes briefly periodically. | XL1000 probably experiencing continuous watchdog resets, or external memory or EEPROM is corrupt. |
| 5 | LED repeatedly blinks ON for 1 s and OFF for 1 s. | XL1000 is unconfigured but has an application. Remedy: Commission XL1000. |
| 6a | OFF for approx. 10 s. Afterwards, the service LED turns ON and remains ON, indicating completion of the blanking process. | Return XL1000 to factory. |
| 6b | OFF for approx. 1 s. Afterwards, the service LED is lit continuously. | Return XL1000 to factory. |
| 6c | OFF for 1 ─ 15 s, depending on application size and system clock. Afterwards, service LED repeatedly flashes ON for 1 s and OFF for 1 s. | XL1000 is unconfigured but has an application. Remedy: Commission XL1000. |
| 7 | LED remains OFF after a short ON duration. | XL1000 is configured and running normally. |
| 8 | LED flashes ON. | XL1000 received a WINK command from LONWORKS; other physical outputs are unaffected. |

In case of a problem, check if the LONWORKS service LED's behavior is changed by resetting the XL1000 using the reset button. Please contact Honeywell if this does not solve the problem.

## Ethernet LEDs

The XL1000 is equipped with two Ethernet LEDs (see Fig. 3).

### Ethernet Link LED

The LED marked " 品 " indicates the Ethernet link's status. Specifically, it is lit whenever an Ethernet jack has been inserted into the corresponding port and the software has established the Ethernet link. It is dark when the link has been disabled.

### Ethernet Activity LED

The LED marked " ↔ " indicates whether or not the Ethernet link is currently active. Specifically, when it flashes, this means that signals are being transmitted / received on the Ethernet network; when it is dark, no messages are being transmitted/received.

## LEDs L1 and L2

At present, these LED's are not in use.

## Reset Button

The reset button can be pressed only using a long, thin tool (e.g. a screwdriver). Pressing it reboots the XL1000's operating system and restarts the application.

# Mounting

## Before Installation

***IMPORTANT***

*To allow the evaporation of any condensation resulting from low shipping / storage temperatures, keep the controller at room temperature for at least 24 h before applying power.*

In order to meet the criteria for CE certification, the XL1000 must be mounted inside an electrical panel.

## Dimensions

The XL1000 has the following dimensions (W x L x H): 278 x 190 x 61 mm. Its housing conforms to IP20. Its pollution degree (2) makes it suitable for use in residential controls, commercial controls, in a clean environment, or non-safety controls for installation on or in appliances.

The XL1000 is suitable for mounting on a standard rail (DIN EN 50022-35 x 7,5) for installation in appropriately-sized wiring cabinets. Allow sufficient clearance (approx. 30 mm) to access the interfaces and to open the swivel cover (see Fig. 9).

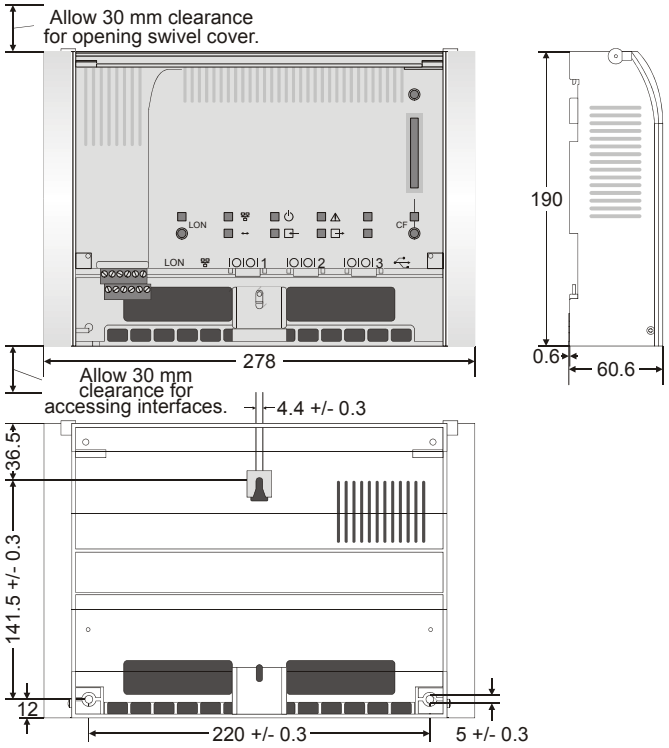



**Fig. 9. Dimensions (in mm)**

## DIN Rail Mounting/Dismounting

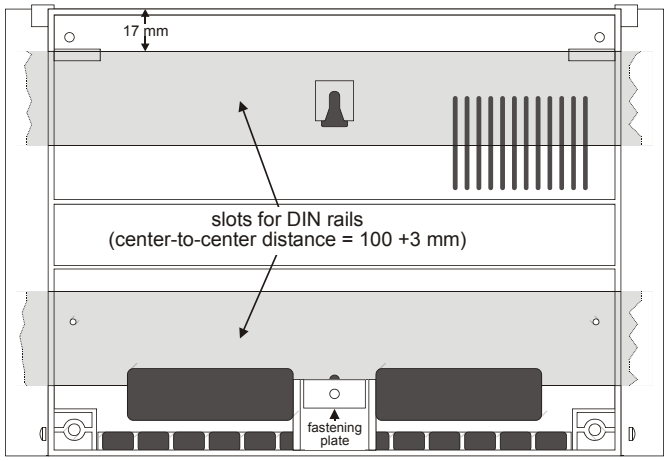



**Fig. 10. Housing base (view from below)**

The XL1000 can be mounted onto DIN rails as follows (refer also to Fig. 11):

1. Hang the upper slot onto the upper DIN rail.
2. Swing the unit down until it is flush with the lower DIN rail.
3. Slide the fastening plate and corresponding screw in the oval hole up against and ***behind*** the bottom edge of the lower DIN rail and screw it firmly into place.
4. If necessary, the swivel cover can be locked by inserting a small string lock, lead seal, or screw into either one of the two openings provided.

The unit is dismounted by loosening the fastening plate and lifting the unit out of place.

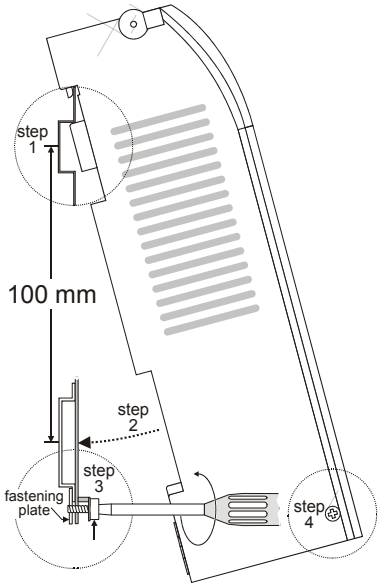



**Fig. 11. Mounting the XL1000 onto two DIN rails**

## Wall/Panel Mounting/Dismounting

The XL1000 can be mounted on walls or in panels in any desired orientation. However, mounting the XL1000 upside down on ceilings should be avoided, insofar as the swivel cover would then swing open.

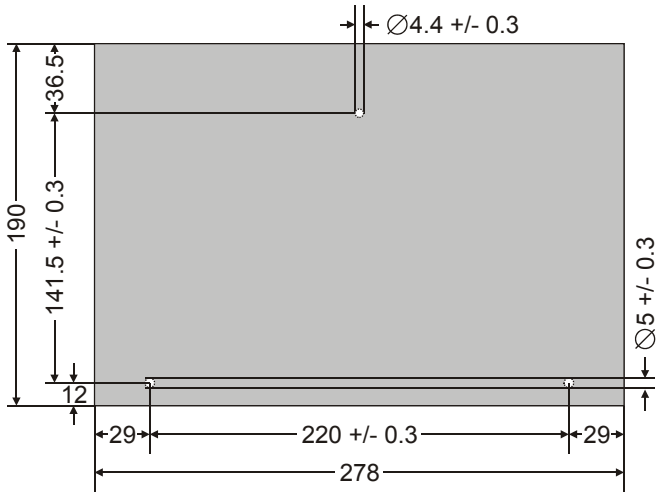



**Fig. 12. Drilling template (view from above)**

## Swivel Cover Lock

The swivel cover can be locked by inserting a small string lock, lead seal, or screw into either one of the two openings provided (see Fig. 11).

# Power Supply

Power is supplied via terminals 1 and 2 of the lower removable terminal plug. The removable terminal plug permits individual XL1000 controllers to be disconnected from the power supply without disturbing the operation of other devices powered by the same source.

**NOTE:** Do not reverse the polarity of the power connection cables, and avoid ground loops (i.e. avoid connecting one field device to several controllers) as this may result in short-circuiting.

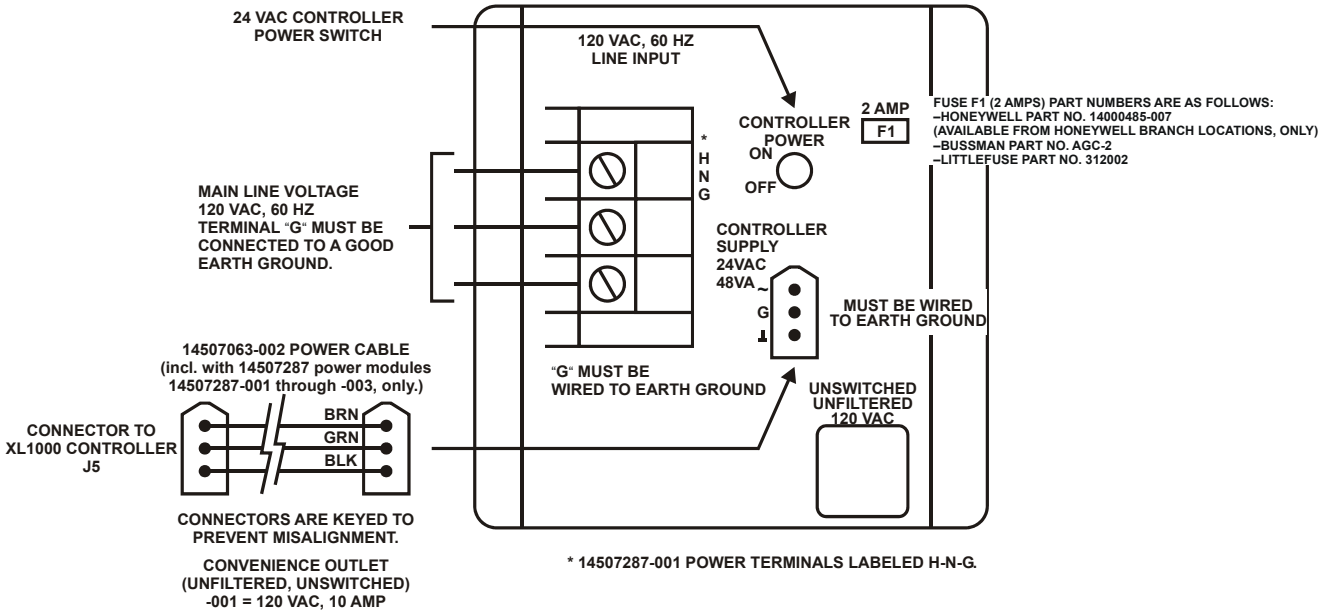
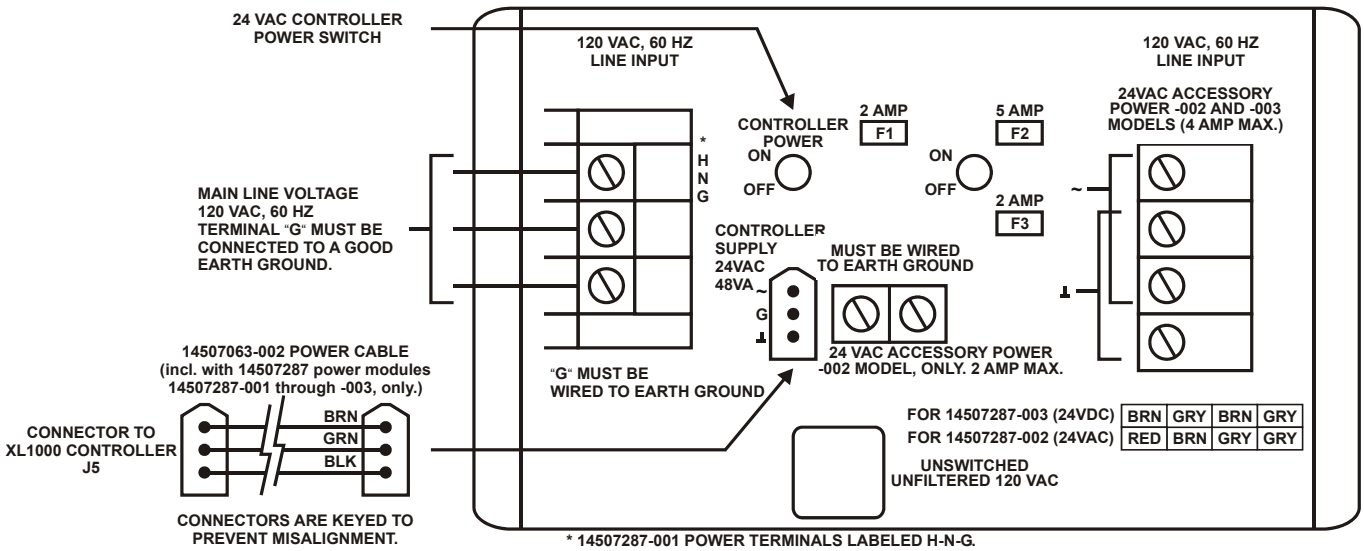

24 VAC CONTROLLER POWER SWITCH
120 VAC, 60 HZ LINE INPUT
2 AMP
F1
CONTROLLER POWER
ON
OFF
* H N G
FUSE F1 (2 AMPS) PART NUMBERS ARE AS FOLLOWS:
–HONEYWELL PART NO. 14000485-007
(AVAILABLE FROM HONEYWELL BRANCH LOCATIONS, ONLY)
–BUSSMAN PART NO. AGC-2
–LITTLEFUSE PART NO. 312002
MAIN LINE VOLTAGE 120 VAC, 60 HZ TERMINAL "G" MUST BE CONNECTED TO A GOOD EARTH GROUND.
CONTROLLER SUPPLY 24VAC 48VA
G
MUST BE WIRED TO EARTH GROUND
14507063-002 POWER CABLE (incl. with 14507287 power modules 14507287-001 through -003, only.)
"G" MUST BE WIRED TO EARTH GROUND
UNSWITCHED UNFILTERED 120 VAC
BRN
GRN
BLK
CONNECTOR TO XL1000 CONTROLLER J5
CONNECTORS ARE KEYED TO PREVENT MISALIGNMENT.
CONVENIENCE OUTLET (UNFILTERED, UNSWITCHED) -001 = 120 VAC, 10 AMP
* 14507287-001 POWER TERMINALS LABELED H-N-G.

**Fig. 13. Typical 14507287-001 Power Module wiring**


24 VAC CONTROLLER POWER SWITCH
120 VAC, 60 HZ LINE INPUT
120 VAC, 60 HZ LINE INPUT
24VAC ACCESSORY POWER -002 AND -003 MODELS (4 AMP MAX.)
2 AMP
F1
5 AMP
F2
2 AMP
F3
CONTROLLER POWER
ON
OFF
ON
OFF
* H N G
MAIN LINE VOLTAGE 120 VAC, 60 HZ TERMINAL "G" MUST BE CONNECTED TO A GOOD EARTH GROUND.
CONTROLLER SUPPLY 24VAC 48VA
G
MUST BE WIRED TO EARTH GROUND
14507063-002 POWER CABLE (incl. with 14507287 power modules 14507287-001 through -003, only.)
"G" MUST BE WIRED TO EARTH GROUND
24 VAC ACCESSORY POWER -002 MODEL, ONLY. 2 AMP MAX.
FOR 14507287-003 (24VDC) BRN GRY BRN GRY
FOR 14507287-002 (24VAC) RED BRN GRY GRY
UNSWITCHED UNFILTERED 120 VAC
BRN
GRN
BLK
CONNECTOR TO XL1000 CONTROLLER J5
CONNECTORS ARE KEYED TO PREVENT MISALIGNMENT.
CONVENIENCE OUTLET (UNFILTERED, UNSWITCHED) -002 AND -003 = 10 AMP
* 14507287-001 POWER TERMINALS LABELED H-N-G.

| POWER MODULE | FUSE NO. | FUSE RATING | HONEYWELL PART NO. | BUSSMAN PART NO. | LITTLEFUSE PART NO. |
|---|---|---|---|---|---|
| 14507287-001 THROUGH -003 | F1 | 2 AMPS | 14000485-007 | AGC-2 | 312002 |
| 14507287-002 AND -003 | F2 | 5 AMPS | 14507374-001 | GMA 5AMP | 235005 |
| 14507287-002 AND -003 | F3 | 2 AMPS | 14000485-007 | AGC-2 | 312002 |

**Fig. 14. Typical 14507287-002, -003 Power Module wiring**

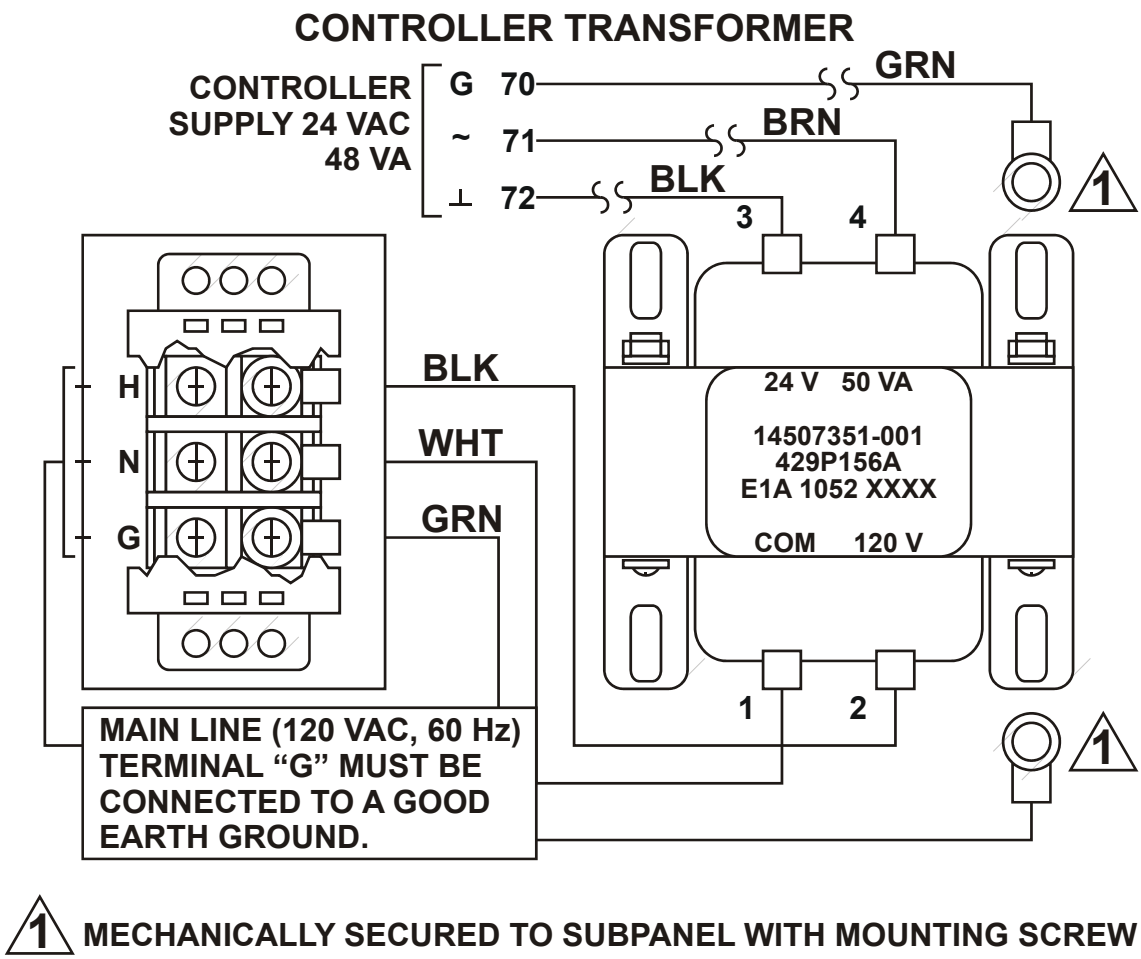



**Fig. 15. Typical 14507287-007 Power Module wiring**

## Lightning Protection

LONWORKS: 14502412-014
Ethernet: 14507678-004

## Interfaces and Bus Connections

The XL1000 System can be connected to the following devices and systems:

**LonWorks Bus**

- For communication with other LONWORKS Bus devices within the building
- FTT10, link power compatible
- Polarity-insensitive

## Technical Data

### System Data

**Table 8. System data**

| | |
|---|---|
| **operating voltage** | 24 VAC/DC, 60 Hz |
| **power consumption** | max. 7 A<br>(one XL1000 + 40 I/O modules) |

**NOTE:** The max. permitted number of LonWorks I/O modules depends upon the type of modules used. In the case, e.g., of XL800 Binary Input Modules, a maximum of 21 may be used.

### Operational Environment

**Table 9. Operational environment**

| | |
|---|---|
| **ambient operating temperature** | 0 ─ 49 °C (32 ─ 122 °F) |
| **ambient operating humidity** | 5 ─ 93 % relative humidity (non-condensing) |
| **ambient storage temperature** | –20 ─ 70 °C (–4 ─ +158 °F) |
| **ambient storage humidity** | 5 ─ 95 % relative humidity (non-condensing) |

# LonWorks Communications

## General Information

The XL1000 is equipped with a free-topology transceiver (FTT10A or FT-X1) for communication (at a data transmission rate of 78 Kbaud) on LONWORKS® networks (using the LonTalk protocol).

The LONWORKS network is insensitive to polarity, eliminating the possibility of installation errors due to miswiring.

Different network configurations (daisy-chain, loop, and star configurations, or any combination thereof) are possible (see also Excel 50/500 LONWORKS Mechanisms Interface Description, EN0B-0270GE51).

## Connecting to the LONWORKS Network

***IMPORTANT***

*Do not bundle wires carrying field device signals or LONWORKS communications together with high-voltage power supply or relay cables. Specifically, maintain a min. separation of 3 inches (76 mm) between such cables. Local wiring codes may take precedence over this recommendation.*

***IMPORTANT***

*Try to avoid installing in areas of high electromagnetic noise (EMI).*

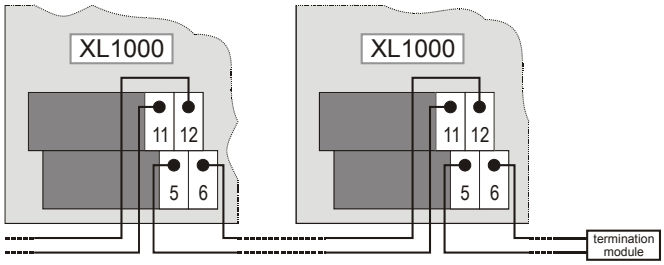



**Fig. 16. Connection to LONWORKS network and termination module (here: daisy-chain network configuration)**

The XL1000 can be connected to the LONWORKS network via terminals 5+6 and 11+12 of the removable terminal plug or via the LONWORKS jack (see also section "LonWorks Interface" on page 8).

This permits individual XL1000 controllers to be connected / disconnected from the LONWORKS network without disturbing the operation of other devices.

Depending upon the chosen network configuration, one or two terminations may be required.

Two different LONWORKS termination modules are available:

- LONWORKS termination module, order no.: **209541B**
- LONWORKS connection / termination module (mountable on DIN rails and in fuse boxes), order no.: **XAL-Term**

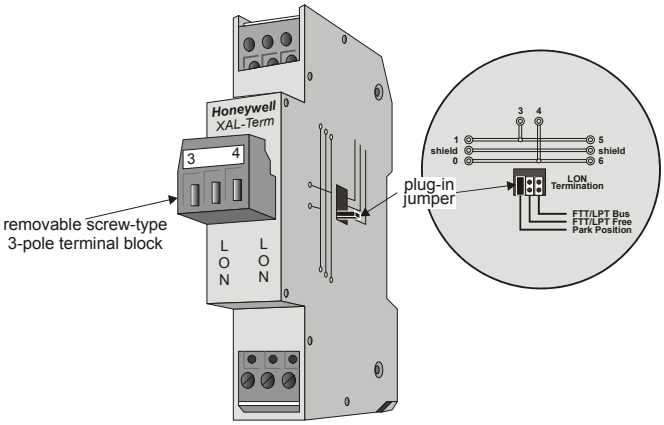



**Fig. 17. LONWORKS connection and termination module**

# Binary Input and Outputs

## Wiring

When wiring the two binary outputs and the binary input, use a min. size of 20 AWG (0.5 $mm^2$) and a maximum of 14 AWG (2.5 $mm^2$). The max. length of all cables is 400 m.

## Binary Input

The XL1000's binary input (a normally-open contact) is ***not*** electrically isolated. It is suitable for connection with / signalling via 24 Vdc voltage or external resistor or dry contact.

The binary input is protected against miswiring. Specifically, it is protected against voltages of up to 29 Vac; when miswired, the XL1000 is unable to detect a valid input signal.

## Binary Outputs

The XL1000 is equipped with two binary outputs.

### Hardware Limits

- A min. current of 50 mA is required to ensure a reliable contact.
- The binary outputs are designed for a max. continuous current of 2 A.
- Switching voltage = 24 Vac, 60 Hz

## Protocolling

In the context of the XL1000, "protocolling" means creating a log of the values or states of the data-points **which have been assigned to this particular XL1000**. Using the browser interface, the user must place the corresponding data-points into "trend." If, at some later point in time, i.e. after lengthy operation, a protocol of the XL1000's history is desired, the corresponding trend data can be generated, viewed, and downloaded (in CSV format) via the browser interface. For the storage of larger amounts of trend data (more than 64,000 trend entries – corresponding to approx. 2 MB), a CF card (see section "CF Port LED, Request Button, and Slot") can be used.

# XL1000 Configuration

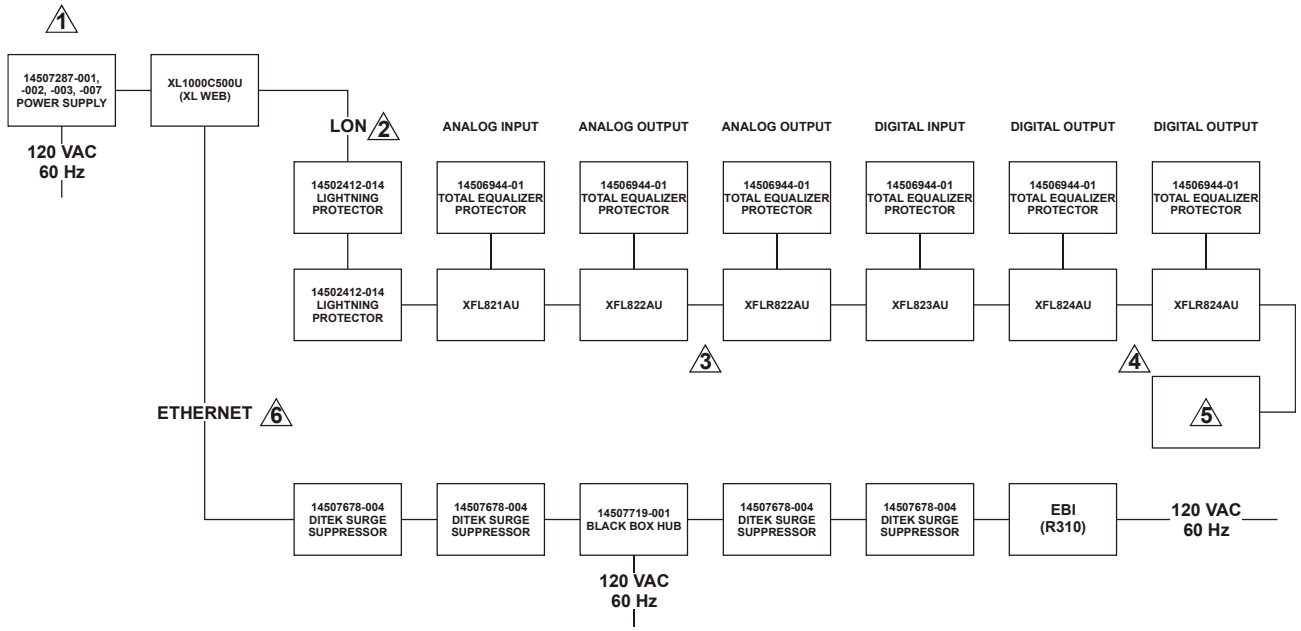



**Fig. 18. XL1000 configuration**

1. Power supply output power
   24 VAC, 60 Hz, 48 VA (-001, -002, -003, and -007)
   24 VAC, 60 Hz, 100 VA (-002 and -003, only)
   24 VAC, 60 Hz, 40 VA (-002, only)
   24 VDC, 60 Hz, 0.6 A (-003, only)

2. LONWORKS wire distance
   1200 m (approx. 4000 ft.)
   24 ohm total line resistance
   47 microfarad capacitance

3. XFL822AU / XFLR822AU
   8 analog outputs
   10 V, 1 mA each

4. XFL824AU / XFLR824AU
   6 digital outputs
   4 A max. per output (relay current)
   12 A max. per module

5. W7761A2010/U
   W7751D2016/U
   W7751F2011/U
   W7751B2010
   W7751H2025
   separately listed S4804, Vol. 3

6. Ethernet line load
   pin 1 – 10 ohm
   pin 2 – 10 ohm
   pin 3 – 10 ohm
   pin 6 – 10 ohm

## Smoke Control Configuration

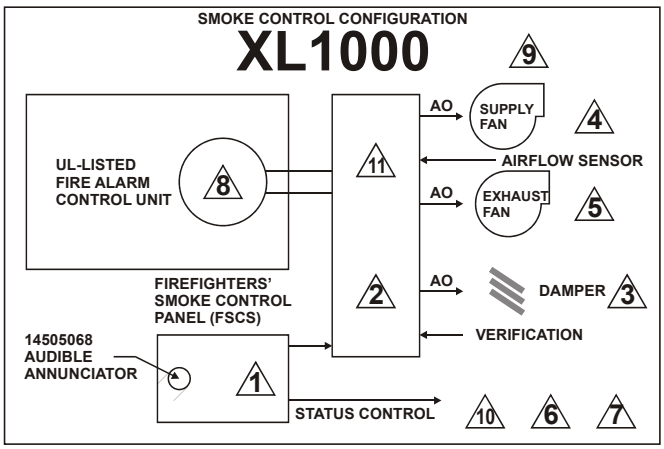



**Fig. 19. Typical smoke control configuration**

**NOTES:**

1. Locate and configure per NFPA 92A, Section 3-4.3.4. UL-listed annunciator / FSCS panel switches have a minimum rating of 24V, 1/10 Amp, and lamps / LEDs have a rating of 24 V, limited to 50 mA.

2. Locate so as to minimize control wiring and piping. Avoid running wires or piping through areas that have a high fire risk.

3. Locate per UL555S.

4. Locate separate from and below all building exhaust fans and upstream of any prevailing winds.

5. Exhaust to outside of building.

6. Locate airflow differential switch.

7. Locate UL-listed damper pressure / position indicator per damper installation instructions.

8. Smoke control must be initiated by a listed fire alarm control unit or in zone automatic alarm devices and not devices located outside of the smoke control zone. Interconnecting wiring must be within 20 ft. (6 meters) and in conduit.

9. Refer to NFPA 92A.

10. Verify that the AC voltage source connected to the inside of the main line voltage terminal block is from a UL-1481 listed uninterruptible power supply. The main line voltage terminal block maximum current draw is 0.5 A. For 220/240 VAC (60 Hz) applications, verify that no potential between any conductor and the earth ground exceeds 150 VAC.

11. All external LONWORKS bus field wiring must be limited to 4000 ft. (1200 meters) and be terminated to 14506944-001 transient protector (35 V, 290 mA max.).

## Data File Set-Up

Generate the engineering data file for the XL1000 Series Controllers. This data file has a mix of hardware points for the necessary inputs and outputs to control fans, dampers, and other equipment. In addition to the inputs and outputs, a custom control program is written to control the outputs per the sequence. The XL1000 controllers can reset the program once the data from the operator interface indicates a normal condition for the dedicated smoke control equipment. Wire conditions must be programmed to provide annunciation of trouble conditions.

Also required for a dedicated application for the XL1000, is a weekly time program to test control points, fans, and dampers by exercising the equipment and verifying feedback automatically during low building activity periods.

## Panel Reset

When in Smoke Control Mode, panel reset is accomplished by resetting the initiating panel contact circuit or by the separate initiating/reset switch on the FSCS panel.

## CAUTION

**Risk of electric equipment damage!**

- ► Failure to use listed/approved replacement parts can damage product, degrade operation and result in loss of safety function.
- ► This product must be installed and operated within its environmental, mechanical, and electrical specifications as contained in this document.
- ► When servicing, use only listed/approved replacement parts ordered directly from the manufacturer.

# Typical Power Limited Circuit for XL1000

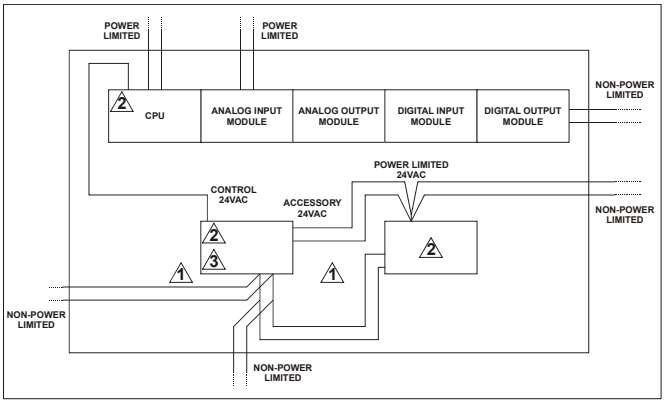



**Fig. 20. Typical power-limited circuit for XL1000**

1 14507287-001 through -003 power module accessory 24 VAC output (rated 2A) must be wired in accordance with NFPA 70, Article 725 when routed within the cabinet or adjacent cabinets and also for external field wiring.

2 14507287-001, -002, -003, and -007 control power module 24 VAC output is inherently power-limited. Thus, all sourced power from the XL1000 controller is power-limited. All field wiring from these controllers meet NFPA 70, Article 725 power limited Class II requirements.

3 If a separate auxiliary power-limited 24 VAC power source is required, use a control power module (14507287-001 or -007 control supply).

4 Devices must be installed in areas as shown. All cable must be routed as shown. All internal power-limited wiring must be separated by ¼ inch (6 mm) or barrier from non-power-limited wire. Excess wiring must be cut, trimmed, and dressed properly to ensure that proper clearances are maintained.

# Connecting Single Bus Controller Systems

This section describes how to connect a controller system which uses **LONWORKS I/O modules, only**.

## XL1000, I/O Modules on Single Rail

- ► Connect XL1000 and I/O modules using the bridge connectors.

This provides power supply and communication connection. No further wiring is necessary.

## XL1000, I/O Modules on Rails in Single Cabinet

The multiple rails of a controller system are connected in series.

- ► Connect the rail ends as follows:
  - – **Power supply**
    via power supply terminals 73, 74 or 77, 78
  - – **Communication**
    via communication terminals 71, 72 or 75, 76

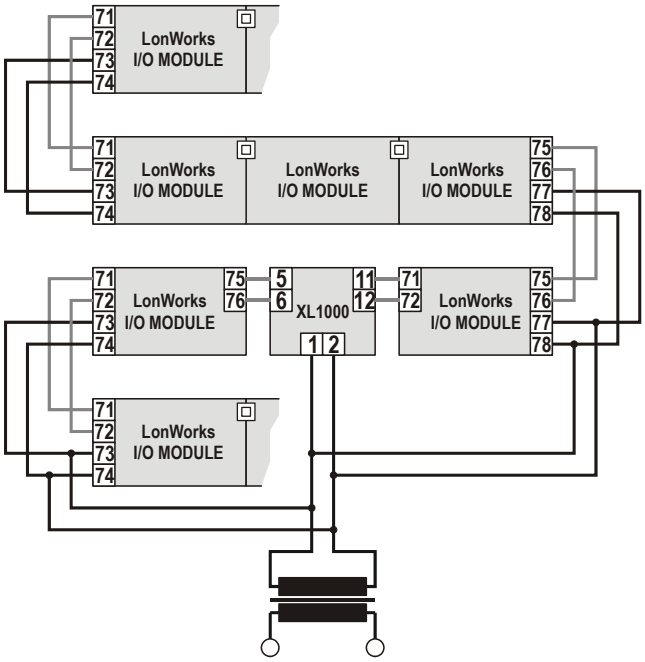



**Fig. 21. Wiring power supply and communication lines to the I/O modules**

### I/O Modules in Separate Rooms

In this scenario, only communication lines must be connected between the rooms.

► Connect the last module of room 1 to the first module of room 2: via communication terminals 71, 72 or 75, 76

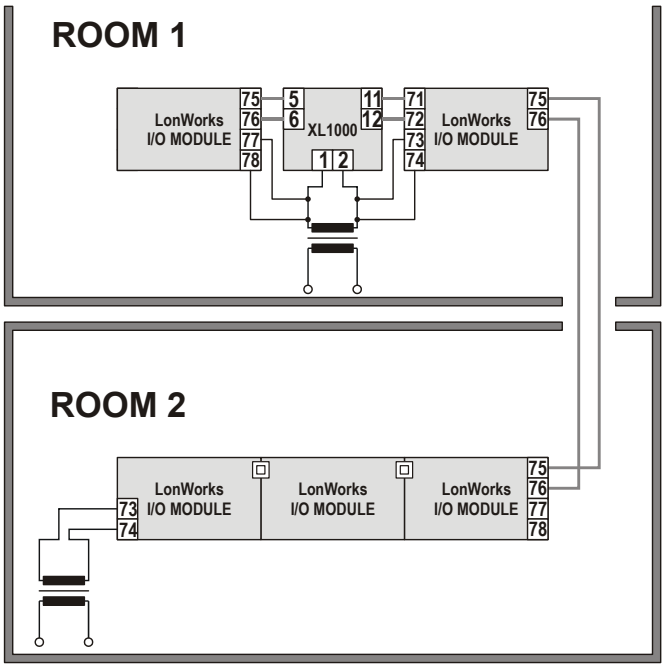



**Fig. 22. Wiring LONWORKS I/O modules in separate rooms**

#### Maximum Cable Length

Max. cable length: 1200 meters (4000 ft), supervised.

## LONWORKS Bus Topologies

The LONWORKS Bus is a 78-kilobit serial link that uses transformer isolation so that the bus wiring does not have a polarity. I.e. it is not important which of the two LONWORKS Bus terminals are connected to each wire of the twisted pair.

The LONWORKS Bus can be wired in daisy chain, star, loop or any combination thereof as long as the maximum wire length requirements are met.

#### Configuration

The recommended configuration is a daisy chain with two bus terminations. This layout allows for max. LONWORKS Bus lengths, and its simple structure presents the least number of possible problems, particularly when adding on to an existing bus.

# Mounting/Dismounting Modules

**⚠ WARNING**

**Risk of electric shock or equipment damage!**

► Do not touch any live parts in the cabinet.

► Disconnect the power supply before you start to install the controller system.
More than one disconnect switch may be required to de-energize the system.

► Do not reconnect the power supply until you have completed the installation.

**NOTE:** The terminal socket of each I/O module can be mounted and wired before inserting and locking the corresponding electronic module.

## Mounting/Dismounting Sockets

### Mounting Sockets

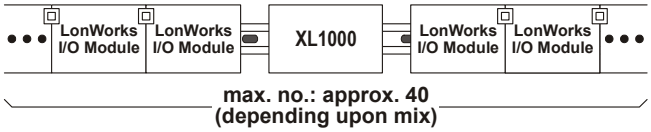



**Fig. 23. Max. number of LONWORKS I/O modules**

**NOTE:** The max. permitted number of LonWorks I/O modules depends upon the type of modules used. In the case, e.g., of XL800 Binary Input Modules, a maximum of 21 may be used.

► Angle the terminal socket at the upper edge of the DIN rail until it snaps in.

► Swing the terminal socket down and apply gentle force until it snaps into position with an audible "click".

► Position terminal sockets flush with one another along the rail.

► If desired, mount stoppers at the ends of the rail to prevent sliding.

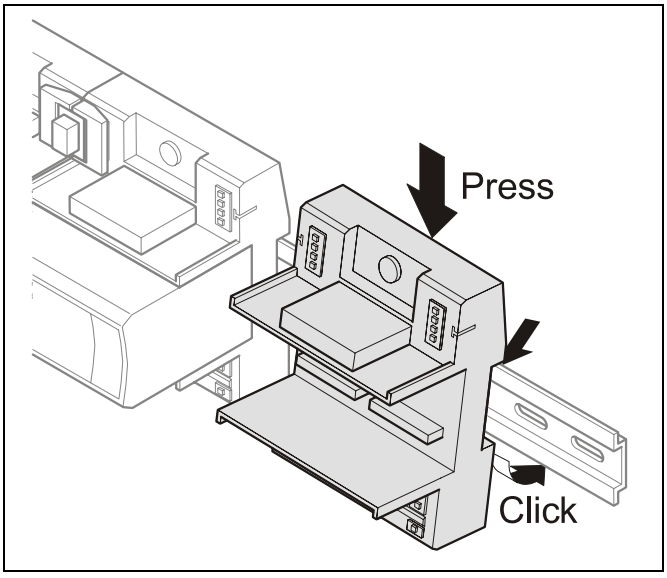



**Fig. 24. Mounting terminal sockets**

## Connecting Sockets

Terminal sockets on the same DIN rail can be connected mechanically and electrically with bridge connectors.

The XL1000 and terminal sockets must be connected using cables.

## NOTICE

**Risk of malfunction!**

► LONWORKS I/O modules must be connected to the XL1000 via LON terminals 5 and 6 and/or 11 and 12.

Position the bridge connector on terminals 71 ─ 74 of the right-hand terminal socket and on terminals 75 ─ 78 of the left-hand terminal socket. Then press the bridge connector down.

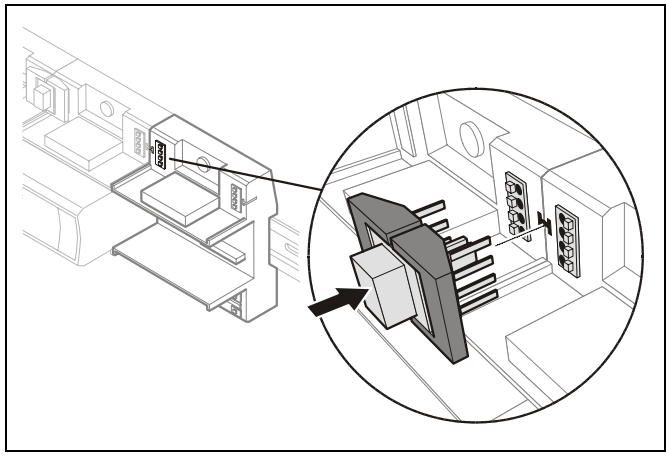


**Fig. 25. Connecting terminal sockets with bridge connector**

**NOTE:** Bridge connectors transmit both communication signals and power supply between I/O modules. Removing bridge connectors will interrupt the transmission of both communication signals and power supply between the I/O modules.

## Dismounting Terminal Sockets

### Disconnecting Terminal Sockets

Release all bridge connectors before removing the terminal sockets from the DIN rail.

► Press down at the same time both the gray side wings next to the red button and then pull the bridge connector out of the terminal socket.

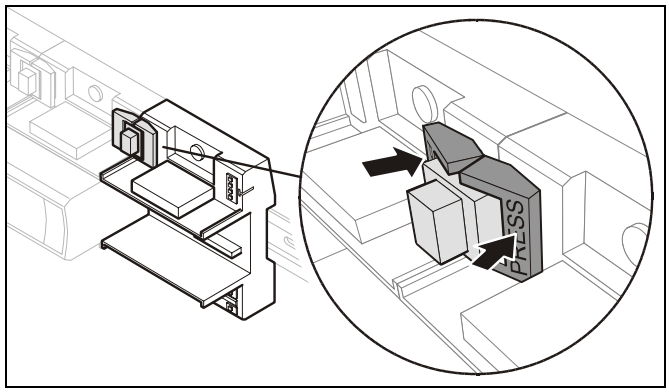



**Fig. 26. Releasing bridge connectors**

### Dismounting Terminal Sockets

► Insert a screwdriver into the latch on the underside of the terminal socket and lever the red latch 2–3 mm downwards. The terminal socket can then be swung away from the rail.

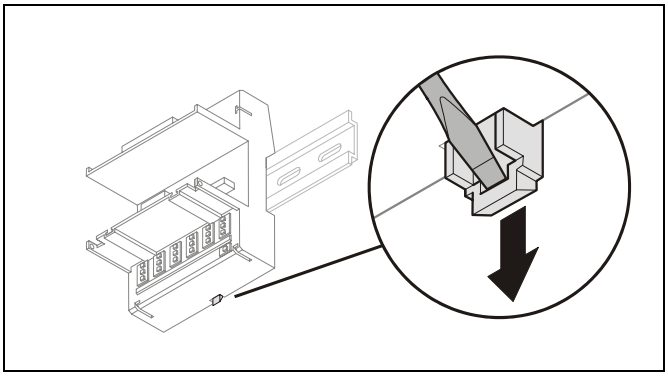


**Fig. 27. Releasing latch**

## Mounting/Dismounting Electronic Modules

### Mounting Electronic Modules

**NOTE:** Electronic modules can be removed from the terminal socket or inserted into the terminal sockets without switching off the power supply. The behavior of connected field devices must be taken into consideration.

► Make sure that terminal socket und I/O module match.

► Make sure that the red locking mechanism is in the open, i.e., left-hand, position.

► Gently push the electronic module onto the terminal socket until snug.

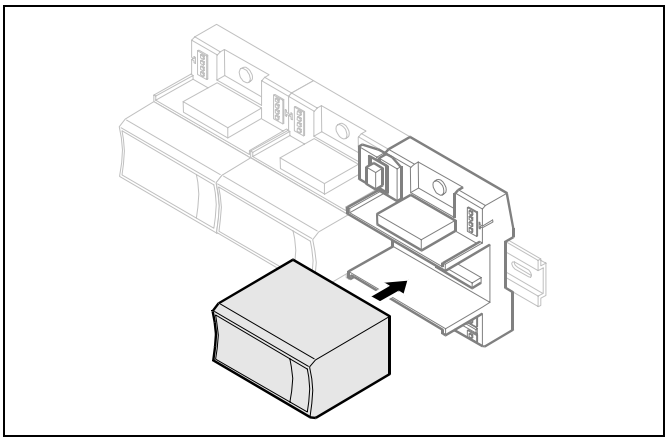


**Fig. 28. Inserting the electronic module**

► Lock the red locking mechanism by sliding it to the right.

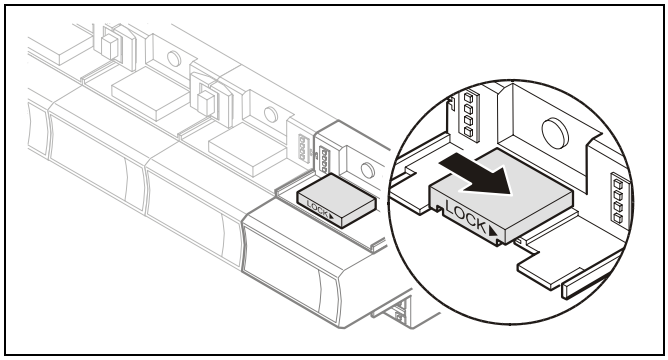



**Fig. 29. Locking the electronic module**

**NOTE:** The red locking mechanism will not close if the electronic module is not properly mounted.

### Dismounting Electronic Modules

**NOTE:** Electronic modules can be removed from the terminal socket or inserted into the terminal sockets without switching off the power supply. The behavior of connected field devices must be taken into consideration.

► Open the red locking mechanism by sliding it to the left and then gently pull the electronic module out of the terminal socket.

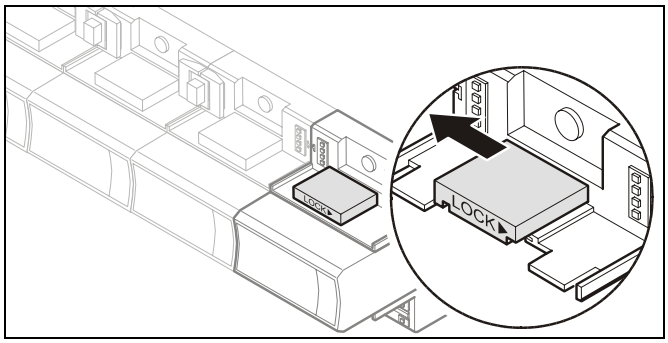



**Fig. 30. Dismounting the electronic module**

## Connecting HMIs or Laptops

Laptops or HMIs (e.g., XI882) can be connected via the XL1000's Ethernet interface (see section "Ethernet Interface" on page 8) or its USB interface (see section "USB Interface Downloads" on page 9).

### Connecting Laptops (XW-Online/CARE)

► Connect a laptop (on which e.g., XW-Online or CARE has been installed) to the XL1000's Ethernet interface (see section "Ethernet Interface" on page 8) or its USB interface (see section "USB Interface Downloads" on page 9).

# Description of the I/O Modules

## Common Features

### Switches Located on the Terminal Socket

**Table 10. Terminal socket switches**

| feature | function |
|---|---|
| Service button S1 | • LED test, see section "Troubleshooting" on page 31<br>• LONWORKS service button functionality for LONWORKS I/O modules |
| Hex switch S2 | • No function. |

### LEDs Located on the I/O Module

**Table 11. LEDs on I/O module**

| feature | function |
|---|---|
| Service LED (yellow) | • Service information, see section "Troubleshooting" on page 31 |
| Power LED (green) | • Information on power supply, see section "Troubleshooting" on page 31 |

For the location of these elements, see figures of the respective modules.

# Analog Input Modules

## Types of Analog Input Modules

**Table 12. XL800 Analog Input Modules**

| type | description | housing |
|---|---|---|
| XFL821 | LONWORKS Analog Input Module | dark-gray |
| XS821-822 | terminal socket | light-gray |

## Features

- 8 analog inputs
- Sensor-break and short-circuit detection, see section "Troubleshooting" on page 31.

**Fig. 31. XFL821AU Analog Input Module with terminal socket**

**Legend**

1 Service button S1
2 Hex switch S2 (no function)
3 Service LED
4 Power LED

Functionality of service LED and power LED: see Table 24 and following.

## Terminals

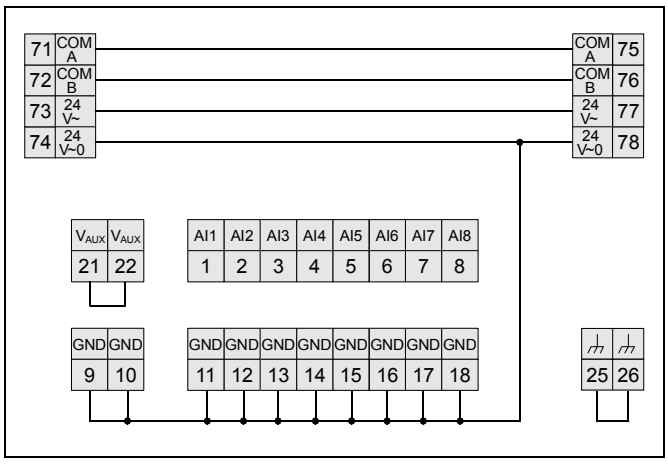



**Fig. 32. Terminal assignment and internal connections of Analog Input Modules**

**Table 13. Description of Analog Input Module terminals**

| ter-minal | signal | comment |
|---|---|---|
| 71, 75 | COM a | 2-wire LONWORKS communication bus |
| 72, 76 | COM b | 2-wire LONWORKS communication bus |
| 73, 77 | 24 V~ | Power supply |
| 74, 78 | 24 V~0 | Power supply |
| 1 ─ 8 | AI1 ─ AI8 | Analog inputs 1 ─ 8 |
| 9 ─ 18 | GND | Ground. All grounds are connected internally to each other |
| 21, 22 | 10 VDC / 5 mA | Auxiliary voltage signal (used e.g. for supplying setpoint potentiometers). **Connections to these terminals must be made in the same room.** |
| 25, 26 | ⏚ | Shield connection (functional earth), internally connected to the DIN rail |

**NOTE:** Shield connection to be used for shielded I/O cables only. It is not allowed to connect a LONWORKS shield.

## XFL821AU Connection Examples

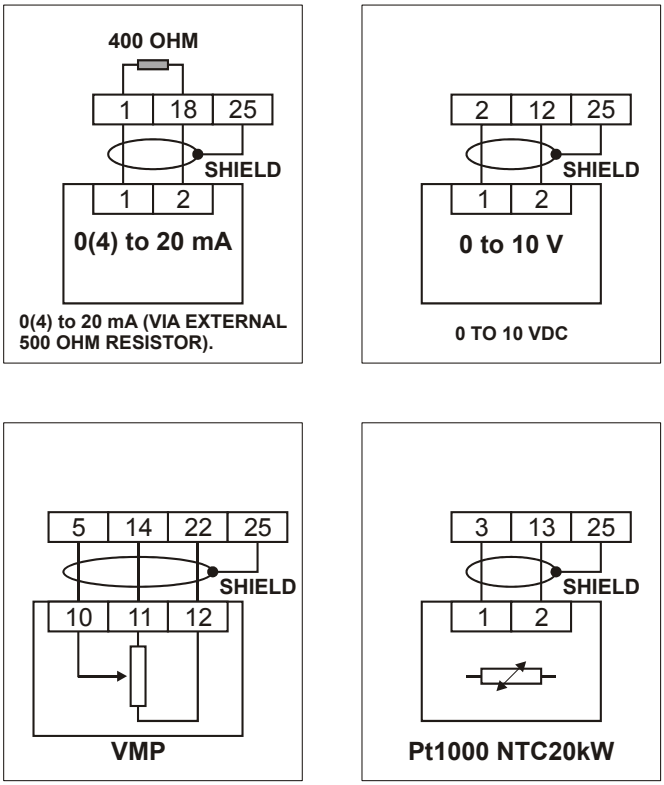



**Fig. 33. XFL821AU Analog Input Module, connection to field devices**

# Analog Output Modules

## Types of Analog Output Modules

**Table 14. XL800 Analog Output modules**

| type | description | housing |
|---|---|---|
| XFL822 | LONWORKS Analog Output Module | dark-gray |
| XFLR822 | LONWORKS Analog Output Module with manual overrides | dark-gray |
| XS821-22 | terminal socket | light-gray |

## Features

- 8 analog outputs;
  can also be configured per output as binary outputs
  (0 ─ 10 V, 2 ─ 10 V, ON/OFF, or floating)
- Corresponding output status LEDs (red)
- XFLR822AU: 8 manual overrides

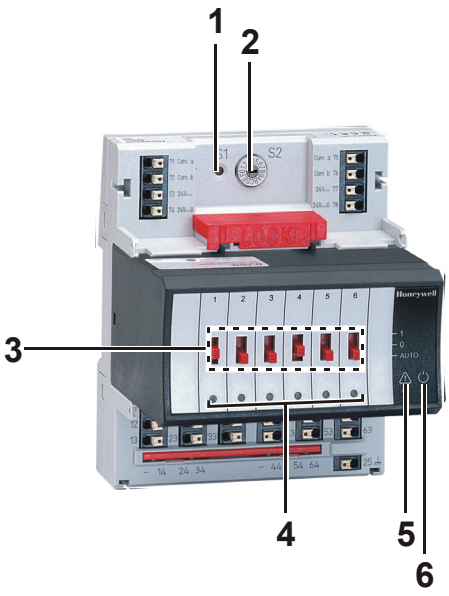



**Fig. 34. XFLR822AU Analog Output Module with terminal socket**

**Legend**

1 Service button S1
2 Hex switch S2 (no function)
3 Manual overrides
4 Output LEDs
5 Service LED
6 Power LED

Functionality of service LED and power LED: see Table 24 and following.

## Terminals

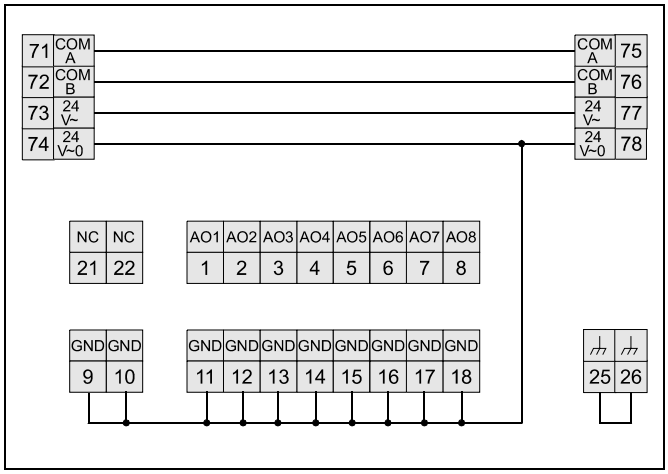



**Fig. 35. Terminal assignment and internal connections of the Analog Output Modules**

**Table 15. Description of Analog Output Module terminals**

| ter-minal | signal | comment |
|---|---|---|
| 71, 75 | COM a | 2-wire LONWORKS communication bus |
| 72, 76 | COM b | 2-wire LONWORKS communication bus |
| 73, 77 | 24 V~ | Power supply |
| 74, 78 | 24 V~0 | Power supply |
| 1 ─ 8 | AO1 ─ AO8 | Analog outputs 1 ─ 8 |
| 9 ─ 18 | GND | Ground. All grounds are connected internally to each other |
| 21, 22 | N.C. | Do not use! |
| 25, 26 | ⏚ | Shield connection (functional earth), internally connected to the DIN rail |

**NOTE:** Shield connection to be used for shielded I/O cables only. It is not allowed to connect a LONWORKS shield.

## Technical Data

**Table 16. Analog Output Module status LED behavior**

| | |
|---|---|
| **automatic mode** | brightness follows the commanded output signal |
| **override mode** | flashes |

## Modules with Manual Overrides

The XFLR822AU Analog Output Modules are equipped with manual overrides: one rotary knob for each analog output.

The manual overrides can be set manually to either "auto" or "0 ─ 110%".

## NOTICE

**Damage to the electronic module!**

► Do not use a tool to adjust the rotary knobs.

► Do not use excessive force. Adjust only by hand.

## XFL822AU Connection Example

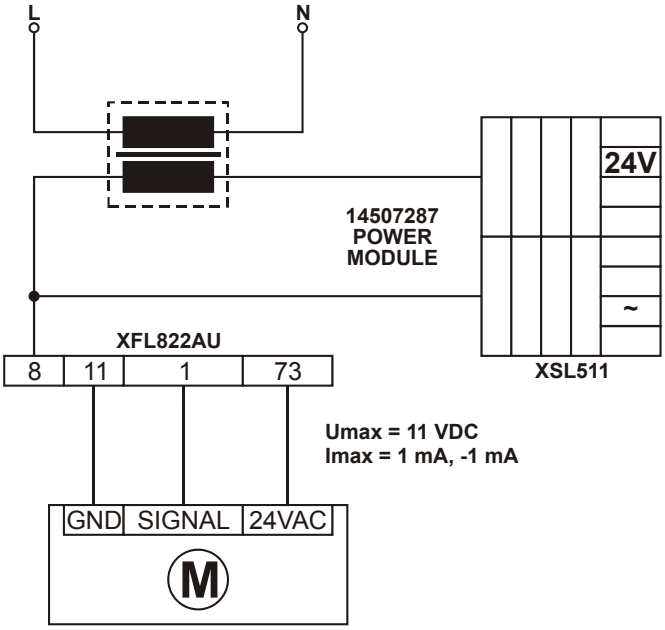



**Fig. 36. XFL822AU Analog Output Module, connection to field devices**

## Synchronization Behavior of Analog Output Module Configured as Floating Output

In order to regularly update the real actuator position with the calculated position and thus ensure that the actuator definitely reaches its end position, a synchronization process is performed by the Analog Output Module.

During the synchronization process, the Analog Output Module will continue running for the configured runtime once it reaches the calculated end position.

This updating (synchronization) is performed:

- If the calculated position of the actuator < lower synchronization threshold (2 %) = synchronization towards 0 %
- If the calculated position of the actuator > upper synchronization threshold (98 %) = synchronization towards 100 %
- Following any power-up or any reset

# Binary Input Modules

## Types of Binary Input Modules

**Table 17. XL800 Binary Input Modules**

| type | description | housing |
|---|---|---|
| XFL823 | LONWORKS Binary Input Module | dark-gray |
| XS823 | terminal socket | light-gray |

## Features

- 12 binary inputs
- 12 configurable status LEDs (green/red, yellow/OFF)
- Binary inputs can be used as static digital inputs (dry-contacts)

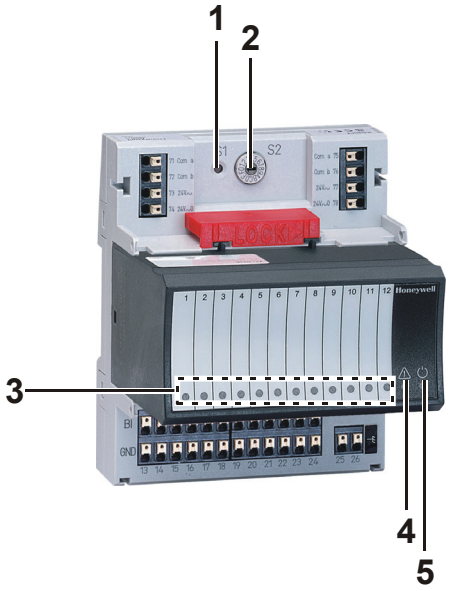



**Fig. 37. XFL823AU Binary Input Module with terminal socket**

**Legend**

1 Service button S1
2 Hex switch S2 (no function)
3 Input LEDs
4 Service LED
5 Power LED

Functionality of service LED and power LED: see Table 24 and following.

## Terminals

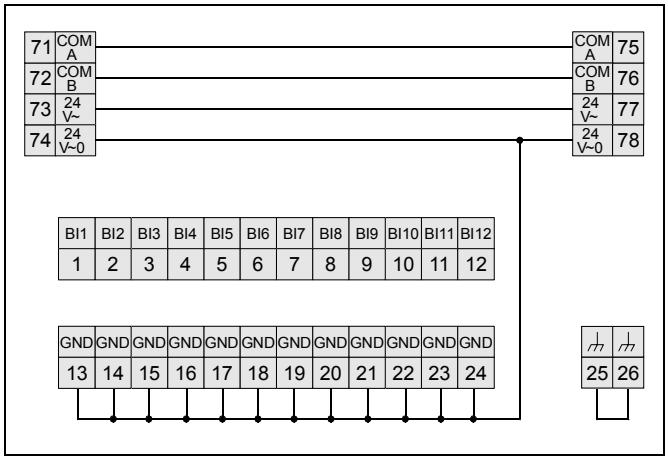



**Fig. 38. Terminal assignment and internal connections of Binary Input Modules**

**Table 18. Description of Binary Input Module terminals**

| ter-minal | signal | comment |
|---|---|---|
| 71, 75 | COM a | 2-wire LONWORKS communication bus |
| 72, 76 | COM b | 2-wire LONWORKS communication bus |
| 73, 77 | 24 V~ | Power supply |
| 74, 78 | 24 V~0 | Power supply |
| 1 ─ 12 | BI1 ─ BI12 | Binary inputs 1 ─ 12 |
| 13 ─ 24 | GND | Ground. All grounds are connected internally to each other. |
| 25, 26 | ⏚ | Shield connection (functional earth), internally connected to the DIN rail. |

**NOTE:** Shield connection to be used for shielded I/O cables only. It is not allowed to connect a LONWORKS shield.

## Technical Data

**Table 19. Technical data for of Binary Input Modules**

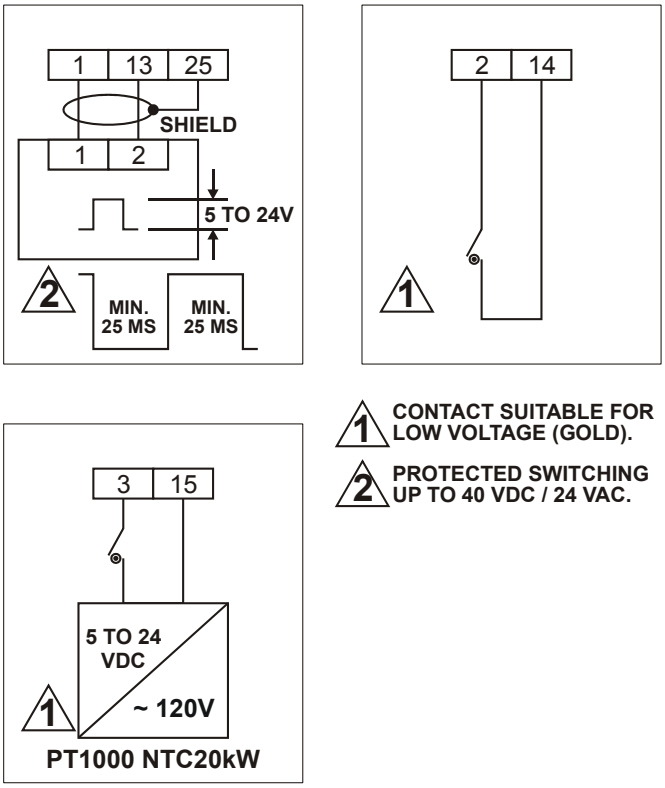
| | |
|---|---|
| **input type** | dry-contact |
| **current rating (closed input)** | 2 mA |
| **open contact voltage** | 16 ─ 22 VDC |

## Status LEDs

The status LEDs can be configured individually for use as either alarm LEDs (red/green) or as status LEDs (yellow/OFF [default]).

Given a state of "logical ON," the LED will be lit (yellow or red).

## XFL823AU Connection Examples




1 CONTACT SUITABLE FOR LOW VOLTAGE (GOLD).

2 PROTECTED SWITCHING UP TO 40 VDC / 24 VAC.

**Fig. 39. XFL823AU Binary Input Module, connection to field devices**

# Relay Output Modules

## Types of Relay Output Modules

**Table 20. XL800 Relay Output Modules**

| type | description | housing |
|---|---|---|
| XFL824 | LONWORKS Relay Output Module | dark-gray |
| XFLR824 | LONWORKS Relay Output Module with manual overrides | dark-gray |
| XS824-25 | terminal socket; can be fitted with long (red) cross connector (incl. in scope of the delivery) | light-gray |

## Features

- 6 relays (changeover contacts), arranged in two blocks
- XFLR824AU: 6 manual overrides
- Low and line voltage allowed, see WARNING.

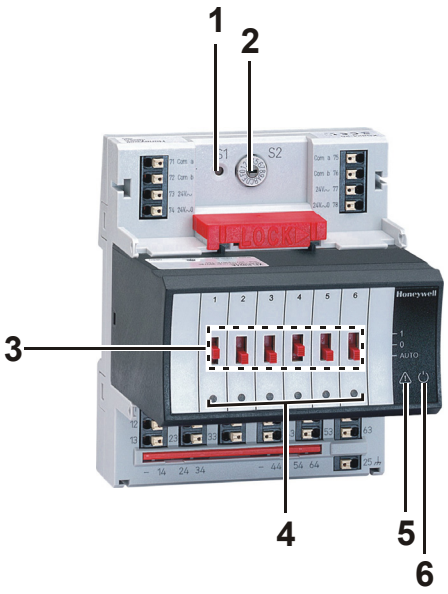



**Fig. 40. XFLR824AU Relay Output Module with terminal socket**

**Legend**

1 Service button S1
2 Hex switch S2 (no function)
3 Manual overrides
4 Status LEDs
5 Service LED
6 Power LED

Functionality of service LED and power LED: see Table 24 and following.

## Terminals

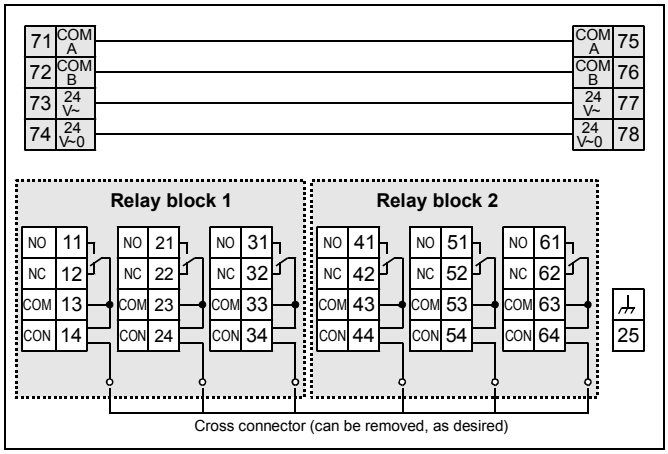



**Fig. 41. Terminal assignment and internal connections of Relay Output Modules**

**Table 21. Description of Relay Output Module terminals**

| terminal | | signal | comment |
|---|---|---|---|
| 71, 75 | | COM a | 2-wire LONWORKS communication bus |
| 72, 76 | | COM b | 2-wire LONWORKS communication bus |
| 73, 77 | | 24 V~ | Power supply |
| 74, 78 | | 24 V~0 | Power supply |
| RELAY BLOCK 1 | 11 | REL1 N.O. | Relay 1 N.O. contact |
| | 12 | REL1 N.C. | Relay 1 N.C. contact |
| | 13 | R1 COM | relay 1 common contact |
| | 14 | R1 COM | For connection of relay 1 common via cross connector* |
| | 21 | REL2 N.O. | Relay 2 N.O. contact |
| | 22 | REL2 N.C. | Relay 2 N.C. contact |
| | 23 | R2 COM | Relay 2 common contact |
| | 24 | R2 COM | For connection of relay 2 common via cross connector* |
| | 31 | REL3 N.O. | Relay 3 N.O. contact |
| | 32 | REL3 N.C. | Relay 3 N.C. contact |
| | 33 | R3 COM | Relay 3 common contact |
| | 34 | R3 COM | For connection of relay 3 common via cross connector* |
| RELAY BLOCK 2 | 41 | REL4 N.O. | Relay 4 N.O. contact |
| | 42 | REL4 N.C. | Relay 4 N.C. contact |
| | 43 | R4 COM | Relay 4 common contact |
| | 44 | R4 COM | For connection of relay 4 common via cross connector* |
| | 51 | REL5 N.O. | Relay 5 N.O. contact |
| | 52 | REL5 N.C. | Relay 5 N.C. contact |
| | 53 | R5 COM | Relay 5 common contact |
| | 54 | R5 COM | For connection of relay 5 common via cross connector* |
| | 61 | REL6 N.O. | Relay 6 N.O. contact |
| | 62 | REL6 N.C. | Relay 6 N.C. contact |
| | 63 | R6 COM | Relay 6 common contact |
| | 64 | R6 COM | For connection of relay 6 common via cross connector* |
| 25 | | ⏚ | Shield connection (functional earth), internally connected to the DIN rail |
| * Do not connect by wire! | | | |

## Permissible Loads

**Table 22. Permissible loads of Relay Output Modules**

| | max. load |
|---|---|
| **per relay output module (total) (common)** | **24 VAC, 60 Hz**<br>12 A<br>**24 VDC**<br>12 A resistive, 12 A, 0.6 PF |
| **per normally open contact (common)** | **24 VAC, 60 Hz**<br>4 A<br>**24 VDC**<br>4 A resistive, 4 A, 0.6 PF |
| **per normally closed contact (common)** | **24 VAC, 2 A, 60 Hz**<br>**24 VDC**<br>4 A resistive, 4 A, 0.6 PF |

## Status LEDs with Manual Overrides

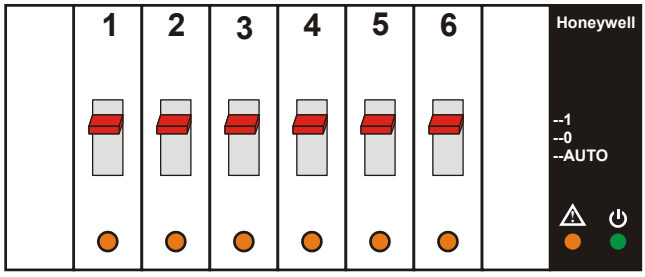



**Fig. 42. Manual overrides (toggle switches)**

The XFLR824AU Relay Output Modules are equipped with six manual overrides: one for each relay output. These toggle switches can manually be set to either "auto" or "0" or "1".

**Table 23. Relay Output Module status LED behavior**

| mode | LED | N.O.* (direct) | N.C.* (reverse) |
|---|---|---|---|
| automatic mode, state “logical ON” | ON | ON | OFF |
| automatic mode, state “logical OFF” | OFF | OFF | ON |
| override mode (setting “0”) | flashes | OFF | ON |
| override mode (setting “1”) | flashes | ON | OFF |

*As configured during engineering.

## Connection Example

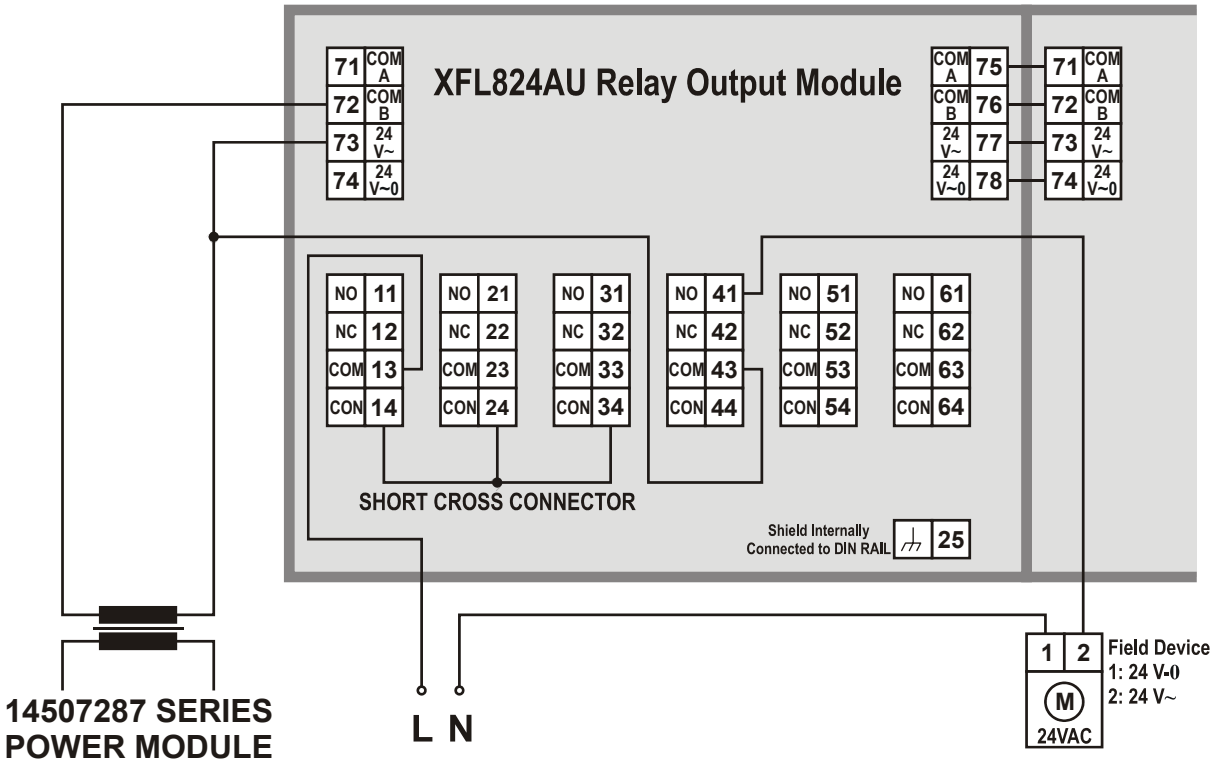



**Fig. 43. XFL824AU connection example**

# Troubleshooting

## Testing Wiring Connections

The push-in terminals feature small holes (1 mm in diameter) which can be used to measure the signals.

► Insert a probe (1) as shown in Fig. 44.

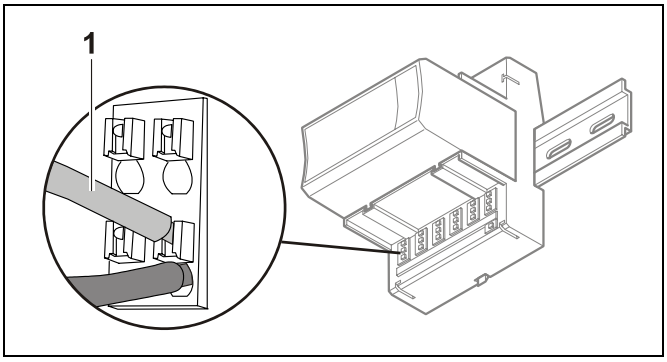



**Fig. 44. Testing wiring connections**

## I/O Modules Troubleshooting

► Check if the power supply voltage level is OK and that there is no high voltage (> 24 VAC or > 40 VDC) connected to the inputs/outputs of the XFL821AU, XFL822AU, XFLR822AU, and XFL823AU I/O modules.

► Replace the problem LONWORKS I/O module with another module of the same kind.

– If the problem persists, this is an indication that the problem is caused by the application or incorrect wiring.

– If the problem is solved, this is an indication that the LONWORKS I/O module was defective.

For troubleshooting purposes on all LONWORKS I/O modules, the following features can be used:

- Power LED
- Service LED
- Service button

In addition, a module-specific troubleshooting may be necessary.

## Power LED of I/O Modules

**Table 24. Power LED of LonWorks I/O modules**

| case | power LED | meaning | remedy |
|---|---|---|---|
| **1** | **ON** | LONWORKS I/O module is powered | No action necessary |
| **2** | **OFF** | No power | ► Check power supply |
| **3** | **flashing continuously** | If the LONWORKS I/O module's service LED is likewise flashing, the LONWORKS I/O module is in the boot mode | ► Wait until rebooting (firmware download) has been completed |

## Service LED of I/O Modules

**Table 25. Service LED of LonWorks I/O modules**

| case | Service LED | meaning | remedy |
|---|---|---|---|
| **1** | LED remains OFF after power-up | If the power LED is also OFF, then<br>– Defective device hardware<br>– Possible power supply problems, clock problems, defective processor | ► Replace hardware |
| **2** | LED is lit continuously after first power-up | Defective hardware | ► Replace hardware |
| **3** | LED flashes at power up, goes OFF, and then is lit continuously | LONWORKS I/O module lacks application | ► Download application |
| **4** | LED repeatedly blinks<br>ON for 1 sec and<br>OFF for 1 sec | LONWORKS I/O module is unconfigured, but has an application | ► Set module to configured mode |
| **5** | LED remains OFF after a short ON duration | LONWORKS I/O module is configured and running normally | No action necessary |
| **6** | LED flashes continuously in following pattern:<br>4 x ON/OFF followed by pause | Sensor failure of Analog Input Module<br>(this behavior can occur only if the appropriate NV has been bound) | ► Check sensor or connection<br>► Check sensor configuration |
| **7** | LED flashes continuously in following pattern:<br>5 x ON/OFF followed by pause | LONWORKS I/O Module has received the wink command from network, physical outputs are unaffected | No action necessary |
| **8** | LED flashes continuously in following pattern:<br>6 x ON/OFF followed by pause | Boot loader problem or hardware defect | ► Replace hardware |
| **9** | LED flashes continuously in following pattern:<br>7 x ON/OFF followed by pause | Communications failure | ► Check bus wiring<br>► Check heartbeat |

Honeywell

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